

Gold

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Canada's gold output decreased by 3.1% to 166.1 t in 1998. Canada is the world's fourth largest gold producer behind South Africa, the United States and Australia. The value of Canadian gold shipments decreased by 8.1% to \$2.3 billion in 1998.

The average price of gold decreased to US\$294.11/troy oz in 1998, its lowest annual price since 1978, from \$331.03/oz (London a.m. fix) in 1997. The price volatility was moderate with gold trading in a range of US\$314.60-\$273.40/oz. In addition to the threat of widespread central bank gold sales, the gold price was depressed because of the strengthening of the U.S. dollar and the sharp drop in gold consumption.

Unless gold prices recover to above \$320/oz before the end of 1999, Canada's gold production will likely decline to around 155 t/y in 2000. It is expected that potential future sales by the Swiss National Bank by the year 2000 could further erode market confidence. Because of this low gold price environment, it is expected that several companies will merge to improve their financial performance.

CANADIAN DEVELOPMENTS

There were about 40 primary gold mines operating in Canada at the end of 1998 accounting for 92.2% of the gold produced. The rest of the gold production came from base-metal mines (6%) and placer operations (1.8%). During 1998, three mines opened and two closed, while others resorted to layoffs to deal with low prices. In addition, several mine openings and expansions have been postponed until market conditions improve. Employment in primary gold mines in 1997 totalled 9656, compared to 10 099 in 1996. Employment figures in the gold industry have been generally declining from their 1989 peak of 12 631.

British Columbia

British Columbia's gold production increased by 24.1% to 21.7 t in 1998 from 17.5 t in 1997.

Royal Oak Mines Inc. started commercial production at the Kemess gold project in October 1998 at a rate of 6.5 t/y. Kemess has reserves of 200 Mt grading 0.63 g/t gold and 0.22% copper.

The Eskay Creek project of Homestake Mining Company is British Columbia's largest gold producer with an output of approximately 8 t in 1998. The ore at the Eskay Creek mine, which began production in 1995, is shipped to smelters in Japan and North America. Homestake completed the construction of a \$17 million, 150-t/d milling facility at the Eskay Creek mine. The mill treats material from ore zones that is amenable to gravity and flotation concentration. Eskay Creek is one of the highest-grade deposits in the world with reserves of 1.3 Mt grading 63 g/t gold.

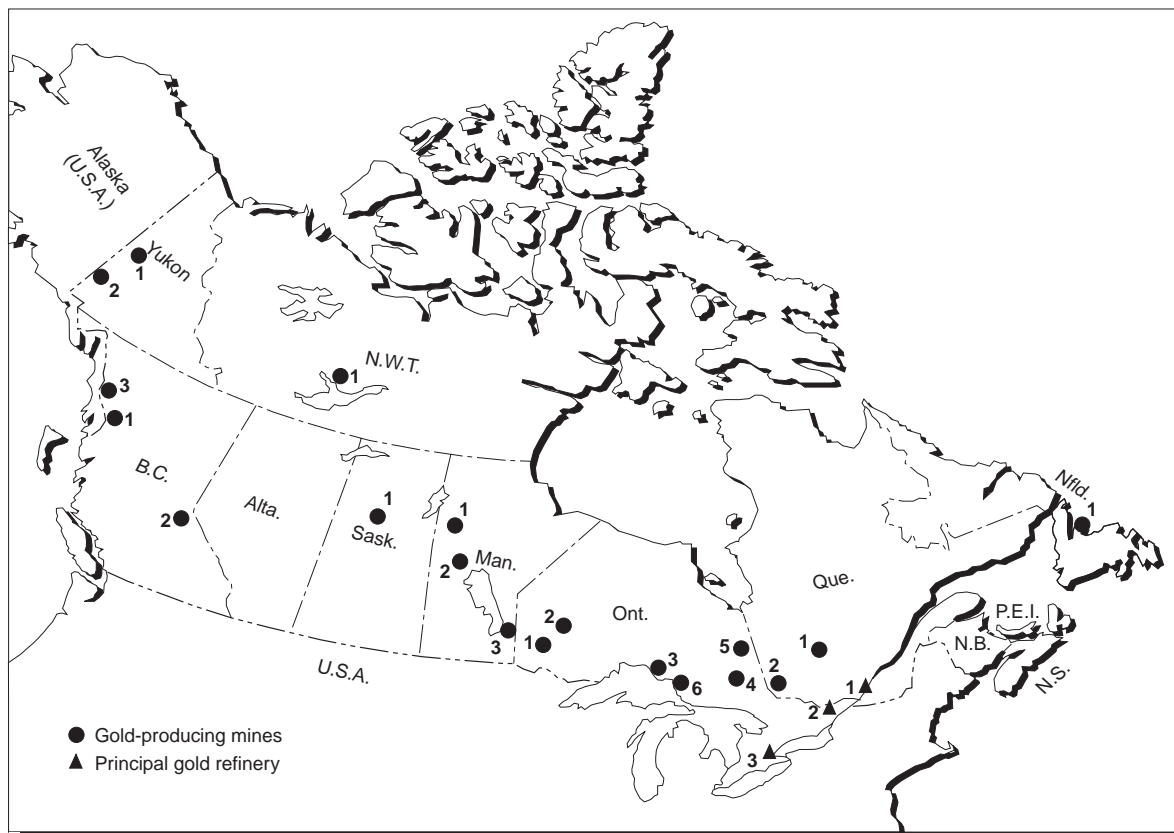
Homestake Mining's Snip mine is expected to close by the middle of 1999 due to exhaustion of ore reserves. The Snip mine has a production capacity of 4 t/y.

Northwest Territories and the Yukon

Gold production in the Northwest Territories (N.W.T.) and the Yukon decreased by 54.3% from 20.8 t in 1997 to 9.6 t in 1998. This major decline in production is the result of the closure of Royal Oak Mines Inc.'s Colomac mine (4 t/y) in early 1997 and Echo Bay Mines Ltd.'s Lupin mine (5 t/y) in early 1998. High operating costs and the low price of gold caused these mines to close. In addition, Miramar Mining Corporation's Con mine was closed from May until December 1998 because of a labour conflict.

A total of 900 jobs were lost in the N.W.T. as a result of the closure of these two mines and as a result of layoffs at Royal Oak's Giant mine (25) and Miramar's Con mine (130). Operating costs in N.W.T. gold mines are particularly high due to high wages and high transportation and energy costs.

Figure 1
Primary Canadian Gold Mines and Principal Gold Refineries, 1998



PRIMARY GOLD MINES

Yukon

1. Viceroy Resources Corporation – Brewery Creek mine
2. B.Y.G. Natural Resources Inc. – Mt. Nansen mine

Northwest Territories

1. Royal Oak Mines Inc. – Giant mine
Miramar Mining Corporation – Con mine

British Columbia

1. Homestake Mining Company – Eskay Creek mine
2. Imperial Metals Corporation/Sumitomo Corp. – Mount Polley mine
3. Homestake Mining Company – Snip mine
North American Metals Corp. – Golden Bear mine

Saskatchewan

1. La Ronge Area
Claude Resources – Seabee mine

Manitoba

1. Black Hawk Mining Inc. – Keystone mine
2. TVX Gold Inc./High River Gold Mines Ltd. – New Britannia mine
3. Harmony Gold Mining Company – Bissett mine

Ontario

1. Red Lake Area
Placer Dome Inc. – Campbell mine
Goldcorp Inc. – Red Lake mine
2. Pickle Lake Area
Placer Dome Inc./TVX Gold Inc. – Musselwhite mine
3. Hemlo Area
Homestake Mining Company/Teck Corporation – Williams mine
Battle Mountain Gold Company – Golden Giant mine
Homestake Mining Company/Teck Corporation – David Bell mine
4. Timmins – Kirkland Lake Area
Placer Dome Inc. – Dome mine
Royal Oak Mines Inc. – Pamour, Hoyle and Nighthawk Lake mines
Kinross Gold Corporation – Hoyle Pond mine

Ontario (cont'd)

4. Timmins – Kirkland Lake Area (cont'd)
Kinross Gold Corporation – Macassa mine
Barrick Gold Corporation – Holt-McDermott mine
Battle Mountain Gold Company/Teddy Bear Valley
Mines, Limited – Holloway mine
Exall Resources Limited/Glimmer Resources Inc. – Glimmer mine
5. Placer Dome Inc. – Detour Lake mine
6. River Gold Mines Ltd. – Eagle River and Edwards mines

Quebec

1. Desmaraisville – Chibougamau Area
Campbell Resources Inc. – Joe Mann mine
2. Rouyn-Noranda – Val-d'Or Area
Barrick Gold Corporation – Bousquet mine
Agnico-Eagle Mines Limited – LaRonde mine
McWatters Mining Inc. – Sigma and Kierna mines
Cambior inc./Aurizon Mines Ltd. – Sleeping Giant mine
Cambior inc. – Doyon and Mouska mines
Richmont Mines Inc. – Francœur mine
Western Quebec Mines Inc. – Joubi mine
Aurizon Mines Ltd./Louvern Mines Inc. – Beaufor mine

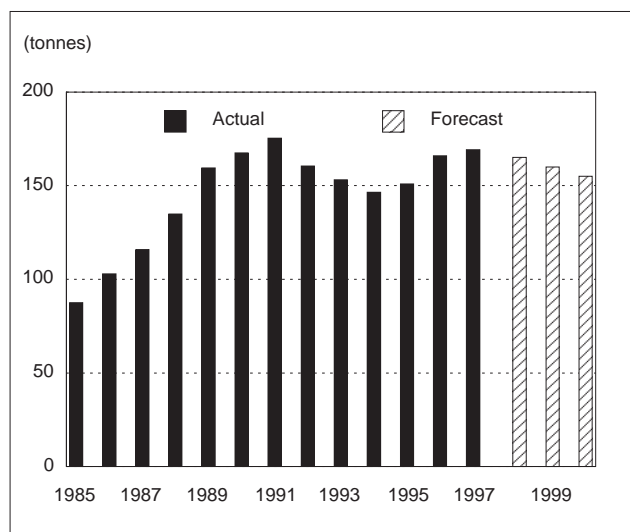
Newfoundland

1. Richmont Mines Inc. – Nugget Pond mine

PRINCIPAL GOLD REFINERIES

1. Noranda Inc., CCR Division
2. Royal Canadian Mint
3. Johnson Matthey Limited

Figure 2
Canadian Gold Production, 1985-2000



Source: Natural Resources Canada.

Saskatchewan

Following the closure of Cameco Corporation's Contact Lake mine in the middle of 1998, Claude Resources Inc.'s Seabee mine became the only operating gold mine in Saskatchewan.

Manitoba

Manitoba's gold production increased by 3.3% in 1998 to 8.4 t. Most of its gold production is derived from Black Hawk Mining Inc.'s Keystone mine and TVX Gold Inc.'s New Britannia mine. Both mines are located in the Lynn Lake region.

The Bissett gold mine, located near Bissett, was re-opened in the summer of 1998 by Harmony Gold. It had been closed since November 1977 due to low gold prices and financial problems by the previous owner, Rea Gold Corporation. Bissett's target production was initially planned to be nearly 3 t/y of gold.

Ontario

Ontario's gold production increased by 4.2% to 84 t in 1998, compared to its 1997 level of 80.6 t. The increase in Ontario's production was mainly due to a full year of production at the Musselwhite mine owned by Placer Dome Inc. (68%) and TVX Gold Inc. (32%). The Musselwhite mine, which is located in northwestern Ontario, has a production capacity of 6 t/y.

The three mines in the Hemlo area accounted for 35.3% of Ontario's total gold production in 1998. Claude Resources re-opened the old Madsen mine in

the Red Lake region. Annual production at the Madsen mine is expected to be around 1.5 t. As a result of the low gold price and reserve depletion, Placer Dome Inc. announced that the Detour Lake mine will close in the middle of 1999. Its current production rate is approximately 3.8 t/y.

Goldcorp Inc. plans to re-open the Red Lake mine by the year 2000. Estimated production at the Red Lake mine is expected to be 8 t/y.

Ontario's output of gold is expected to remain relatively stable at around 85 t/y until the end of the decade.

Quebec

Quebec's gold production increased by 2.1% from 37.2 t in 1997 to 38 t in 1998.

The Casa Berardi mine was purchased by Aurizon Mines from TVX Gold Inc. Once an exploration program is completed, Aurizon will conduct a feasibility study to determine if the Casa Berardi mine should be re-opened.

McWatters Mining plans to bring the East Amphi mine on stream in 1999. The gold production level at East Amphi is expected to reach 0.5 t/y.

Future gold production increases in Quebec include Cambior inc.'s Doyon and Mouska mines, which will likely increase their combined production level from 6 t/y to 10 t/y by the year 2000.

Newfoundland

The Nugget Pond mine of Richmond Mines Inc. is the only operating gold mine in Newfoundland.

WORLD DEVELOPMENTS

South Africa

Despite a 3% decline in production, South Africa remained the world's largest gold producer in 1998 with an estimated output of 478 t. South Africa's share of world production was estimated at 19% in 1998, compared to approximately 66% in 1970.

South Africa has moved from being the lowest-cost gold producer in 1985 to being one of the highest-cost producers. Cash costs in South Africa in 1985 were approximately US\$147/oz, while cash costs at other major Western World producers averaged about \$200/oz. However, by 1998, South Africa had a cash cost of \$252/oz, compared to the average Western World cost of \$209/oz. In South Africa, wages represent approximately 50% of total production costs.

Anglogold Ltd., which was formed in June 1998 through a merger of the gold interests of Anglo American Corporation of South Africa Limited and its associated companies, is the world's largest gold producer with an estimated annual production of 200 t in 1998.

In December 1998, Anglogold and Minorco reached an agreement in principle under which Anglogold will purchase Minorco's gold interest for US\$550 million. This acquisition would boost Anglogold's production to around 235 t/y.

The world's second largest gold producer, Gold Fields Ltd., was created as a result of the merger of Gold Fields of South Africa Ltd. and Gencor Ltd. in 1997. Gold Fields has an estimated annual production of 130 t.

Placer Dome Inc. announced in November 1998 that it had reached an agreement in principle with Western Areas Limited of Johannesburg to form a 50-50 joint venture that will develop and operate the South Deep mine and Western Areas' adjacent mining operations. Under current plans, South Deep, which has total reserves of around 1800 t, is expected to produce 11 t/y by the year 2002.

Despite the fact that South Africa accounts for 40% of the world's identified gold reserves, its gold industry faces major difficulties due to declining ore grades (which declined from 13 g/t gold in 1973 to around 5 g/t in 1997), the extreme depth of gold reserves (an average depth of 2500 m), and intensifying competition from low-cost producing countries.

It is expected that in order to remain competitive, some South African companies will have to close their operations. These closures will reduce the employment in gold mines, which is currently about 300 000 employees.

Because some major projects are scheduled to come on stream before the year 2000, South Africa's gold production level is expected to remain above 450 t/y until the end of the decade.

United States

Gold production in the United States in 1998 is expected to remain stable at around 360 t. U.S. gold production has experienced a decade of rapid growth from its 1985 level of 80 t. The United States is the world's second largest gold producer behind South Africa and is the world's lowest cash cost producer at US\$178/oz.

According to the U.S. Geological Survey, 25 mines yielded about 75% of the gold produced in the country. The state of Nevada, with an estimated production of 245 t, was the lead producing state. Several

heap leaching operations in Nevada accounted for about two thirds of U.S. production. The other major producing states were California and Montana.

Newmont Gold Corporation became North America's largest gold producer following its recent acquisition of Santa Fe Pacific Gold Corp. As a result of this acquisition, Newmont's 1998 gold production increased from 53 t to 90 t.

Barrick Gold Corporation operates the Goldstrike and Meikle mines in Nevada. The combined output of these two operations was around 70 t in 1998.

Placer Dome Inc. (60%) and Kennecott Minerals Company (40%) own the Cortez mine, which produced approximately 30 t at a cash operating cost of around US\$55/oz in 1998. Total reserves at Cortez are 55 Mt grading 2.5 g/t gold.

After a period of substantial growth, gold production in the United States is expected to decline slightly to around 350 t/y by the end of the decade.

Australia

Australia's gold production decreased by 1% to an estimated 308 t in 1998. Its gold production has shown a spectacular increase over the past 11 years from its 1985 level of 59 t. The growth in Australia's gold industry was made possible by the success of its mining companies continuing their underground operations once their open-pit reserves were exhausted. Australia's gold production is derived mainly from Western Australia (75%), Queensland (12%), the Northern Territory (7%) and New South Wales (3%).

Australian gold mines, which had an estimated average cash cost of around US\$205/oz in 1998, were the world's second highest-cost producers behind South Africa (\$252/oz). However, the use of forward sales has shielded the industry from declines in the price of gold and has enabled higher-cost producers to maintain and, in some cases, expand output.

In New South Wales, Newcrest Mining Limited brought the Cadia Hill mine on stream in September 1998 at a cost of A\$400 million. Cadia Hill, which is scheduled to produce 9 t/y, has reserves of 200 Mt grading 0.74 g/t gold and 0.17% copper.

Because of the current low gold price, Australia's gold production is expected to decrease to around 280 t/y by the year 2000.

Asia and Pacific Rim Countries

In addition to being prolific regions for gold production, Asia and Pacific Rim countries are very significant gold consumers.

China

China's gold production increased by about 5% to 164 t in 1998. According to the Gold Administration Bureau of the Ministry of Metallurgical Industries (MMI), the four provinces that account for 55% of Chinese gold production are Shandong, Henan, Hebei and Shanxi.

It is reported that the majority of China's 600 mines produce less than 0.3 t/y of gold each, with only 40 operations producing more than 0.3 t/y each. The majority of China's production is derived from lode deposits (75%); the balance of output is 15% from placer deposits (mainly from the Heilongjiang Province) and 10% as a by-product of base-metal deposits (primarily copper mines from the Jiangxi and Anhui provinces).

The main government organization producing gold is the China National Gold Corporation (CNGC), which accounts for 10% of China's gold production. The CNGC reports to the MMI's Gold Administration Bureau, which has responsibility for overall policy formulation, management, monitoring and coordination.

By law, gold producers have to sell their entire production to the People's Bank of China (PBOC).

According to the World Gold Council, current gold consumption in China is around 0.2 g/y per person, compared to 8 g/y in Taiwan. The average annual salary for citizens living in the largest 100 cities in China is US\$500. As this figure increases, so should gold demand.

China mints 99.9%-pure gold and silver Panda coins. According to the China Gold Coin Corporation, gold coin sales are estimated at 3 t/y. The gold coins are available in five sizes ranging from one ounce to one twentieth of an ounce.

Should gold prices remain weak, it is expected that China, which currently faces increased production costs, may experience some difficulties in maintaining its production level above 160 t/y in 2000.

Indonesia

Indonesia's gold output increased by 20% to 121 t in 1998. Its gold production is likely to continue to grow at a rapid pace.

The bulk of Indonesia's production is from Freeport McMoRan Copper & Gold Inc.'s Ertsberg/Grasberg copper-gold mine. The company recently completed a fourth expansion of the concentrator that boosted capacity to around 210 000 t/d. Gold production by Freeport McMoRan was around 60 t in 1998. Proven and probable reserves stand at 2 billion t grading 1.18 g/t gold, 3.8 g/t silver and 1.19% copper. The precious metals content of the ore represents 1720 t of gold and 3691 t of silver.

In addition, Newmont Gold Corporation announced that the Batu Hiau copper-gold project will start production at the end of 1999. The Batu Hiau mine, which is expected to cost US\$1.9 billion to develop, will produce in excess of 15 t/y of gold as well as significant copper values. Batu Hiau is owned by Newmont Gold (45%), Sumitomo Metal Mining Co., Ltd. (35%) and an Indonesian partner (20%).

Other major producing mines in Indonesia include Rio Tinto Limited's Kelian mine and Newmont Gold's Minahasa mine.

Papua New Guinea

Papua New Guinea's (PNG) gold production in 1998 increased by 27% to 63 t. This sharp increase in production is the result of a full year of production at the Lihir mine.

Gold production at the new Lihir mine was expected to reach 16 t in 1998 and to reach 21 t in 1999. Lihir has mineable reserves of approximately 100 Mt grading an average of 3.25 g/t gold. Its cash operating cost is expected to be around US\$200/oz for the first five years of the project.

Production from the Porgera gold mine remained stable at around 22 t in 1998. Porgera's proven and probable reserves are 40 Mt grading 4.3 g/t gold. The mine is owned by Placer Dome Inc. (50%) (the operator), Renison Goldfields Consolidated Ltd. (25%) and the Government of PNG (25%).

The OK Tedi gold-copper mine is owned by The Broken Hill Proprietary Company Limited (52%), Inmet Mining Corporation (18%) and the PNG government (30%). The mine has reserves of 300 Mt grading 0.8 g/t gold and 0.8% copper, and a production capacity of 15 t/y of gold.

Placer Dome Inc. announced that mining of its 80%-owned Misima mine will cease during 1999 due to high operating costs. However, milling of ore stockpiles is expected to continue until the year 2000. Misima's 1998 gold production was 6 t.

Commonwealth of Independent States

Gold production in the C.I.S. was estimated to be 250 t in 1998. The general decline in production from a peak of over 285 t in 1989 is largely attributed to the exhaustion of some placer deposits (particularly in Russia) and a shortage of hard currency to develop new mines. About 20% of the C.I.S.'s annual gold production is believed to originate as a by-product of base-metal operations, particularly copper.

As a result of foreign investment, gold production in the C.I.S. is expected to remain stable over the next few years even though there will be a further decline in placer gold production in Russia.

Russia

Within the Russian government, policy functions pertaining to production and refining processes are handled by the Ministry of the Economy. Other responsibilities such as assaying and the sale and use of precious metals and stones are functions of the Ministry of Finance. Organizations that report to the Ministry of Finance include the Central Bank of Russia and Gokhran. The Ministry of Finance has the right of first refusal to purchase precious metals from mining companies.

Russia's gold production in 1998 was reported to have remained stable at around 120 t. Currently, Russia's production originates mostly from the Far East (62%), East Siberia (24%) and the Ural mountains (12%). The decreased Russian production can be attributed principally to declining reserves at several alluvial operations, high taxes, and late payments by central authorities. Other problems include high import taxes for machinery and a shortage of funds for geological surveys.

About 80% of Russia's gold production comes from placer deposits, but these deposits account for only 20% of the total proven reserve base. As gold reserves are generally concentrated in large low-grade deposits, Russia's gold production will likely continue to decline in the medium term.

Russia's gold output is produced by state-owned enterprises as well as by private enterprises and cooperatives known as Artels. There are about 350 producers with various forms of ownership, including 200 Artels that generally operate small placer deposits. Artels account for approximately 60% of Russia's total gold production originating mostly from Magadan, Yakutia and Chita.

Kinross Gold Corporation operates the Kubaka gold project in the Magadan region. Kubaka, which was built at a cost of US\$228 million, is owned by the Omolon Mining Company in which Kinross has a 50% interest. The Kubaka mine is expected to produce 10 t/y for a period of five years.

Sukhoi Log, with estimated reserves of 400 Mt grading 2.6 g/t gold and potential production of 50 t/y, is reported to be one of the largest undeveloped gold deposits in the world. In 1998, the Russian government initiated an international tendering process to develop the deposit.

Natural Resources Canada conducted a survey in 1998 of 17 Canadian mining and exploration companies that are involved in the gold (15), silver (1) and diamond (1) sectors of Russia. A total of around \$225 million (excluding the Kubaka project, which was initially developed by U.S.-based Amax Gold Inc.) was spent from 1995 to 1997 by Canadian

companies on Russian projects. The major areas of expenses incurred by Canadian companies were in exploration, feasibility studies, development, and the acquisition of a minority ownership in a Russian joint-venture partner.

Uncertainty about Russia's legal framework and the jurisdictional conflicts between local and central authorities make the investment climate there unattractive. However, the enormous undeveloped potential of Russia, coupled with its high need for foreign investment, is expected to encourage authorities to make Russia's legal framework more attractive for foreign investment in mining. According to Russian government sources, Russia's gold mining industry would require more than US\$5 billion to build or upgrade approximately 30 mining and milling complexes over the next four years.

Uzbekistan

Uzbekistan's gold production in 1998 decreased by 4% to 78 t. The largest producer is the Muruntau low-grade open-pit mine. It was commissioned in 1969 and is reported to have an annual production rate of 55 t. The mine treats about 20 Mt/y of ore grading 3 g/t gold.

Production at the Zarafshan tailings retreatment joint venture at Muruntau, which began operating in 1996, achieved an output of 14 t in 1998. The Zarafshan joint venture is owned by Newmont Gold (50%), and by the Uzbek State Committee of Geology and Mineral Resources and Navoi Mining and Metallurgical Combinat each with a 25% share. The joint venture calls for the reprocessing of the Muruntau gold tailings with reserves of 150 t of gold over a 16-year period.

Kazakstan

Kazakstan's 15-t/y gold production is derived mostly from the Ust-Kamenogorsk base-metal operation and from the Tselinny mining and chemical plant slag heaps.

No final decision has yet been reached regarding the privatization of the Vasilkovskoye gold deposit. Vasilkovskoye has a geological resource of 138 Mt grading 3 g/t gold.

Kyrgyzstan

Kyrgyzstan's 1998 gold production increased by 3 t to 20 t as the result of a production increase at the Kumtor mine.

The Kumtor mine is owned by Cameco Corporation (33%) and the Kyrgyzstan government (67%). Production at the US\$450 million open-pit gold project started in January 1997. Gold production at Kumtor

reached 18.7 t in 1998. Kumtor has total estimated reserves of 500 t of gold, of which 200 t are amenable to open-pit mining. Grades at Kumtor are 3.9 g/t gold and its cash operating cost is approximately US\$160/oz.

Following a truck accident that resulted in a spill of sodium cyanide on May 20, 1998, a scientific commission of international experts was assembled at the request of Kyrgyzstan to assess the impact. The findings of the Commission revealed that because of cyanide's rapid degradation, the spill had no serious effects on the environment.

Africa

Following important investments by international development agencies and local governments in geoscience activities, as well as the revision of mining codes and investment laws, increased attention is being devoted to gold exploration in African countries. Ghana and Mali are two good examples.

Ghana

Ghana's gold production has more than quadrupled in the past eight years from 17 t in 1990 to 69 t in 1998.

Gold production in 1998 at Ashanti Goldfields Company Ltd.'s Oabusi mine was expected to total 25 t. Production at the Oabusi gold mine is derived from underground operations, an open pit, and tailings retreatment. Total reserves at the mine are 90 Mt grading 7.1 g/t gold. Ashanti Goldfields is owned by Lonrho Plc (41.3%) and the Government of Ghana (31.3%), with institutional and private investors owning the remainder. Ashanti Goldfields also operates the Iduapriem (6 t/y), Ayanfuri (1 t/y) and Bibiani deposits in Ghana.

Gold Fields of South Africa Ltd. announced a production increase at the Tarkwa mine complex. In addition to the current underground operation that produced 1.4 t of gold in 1998, Gold Fields will commission an open-pit mine that will increase production from its current level to 8 t/y by the year 2000. The total resource at Tarkwa is 286.6 Mt grading 1.4 g/t gold.

Mali

Production at Randgold Exploration Ltd.'s Syama mine in Mali was estimated at 5 t in 1998. The other owners of Syama are the Government of Mali (20%) and the International Finance Corporation (IFC) (15%). According to Randgold, production at Syama could increase to 7 t/y within two years.

Anglo American Corporation of South Africa Limited started production at the Sadiola gold mine in early 1997. Production at Sadiola increased from its 1997

level of 11 t to 15.5 t in 1998. Its reserves are estimated at 50 Mt grading 2 g/t gold. Anglo American Corporation and International African Mining Gold Corporation (IamGold) each own 38% of the project, while the Government of Mali and the IFC own 18% and 6%, respectively.

Latin America and Mexico

Currently, there are several international companies pursuing gold mining projects in Latin America, particularly in Peru, Chile and Mexico. South America's gold output could increase from its 1997 level of nearly 310 t to around 350 t/y by the year 2000.

Peru

In 1998, Peru remained Latin America's largest gold producer with a 13% production increase to 85 t. Peru's production is expected to exceed 100 t/y by the year 2000. About 20 t of Peru's gold production was derived from placer operations.

The Yanacocha open-pit heap leaching mine of Newmont Gold Corporation (51%), Compania Minera Condessa (44.3%) and the IFC (5%) remained South America's largest gold mine in 1998 with a production level of 41 t at a cash operating cost of around US\$100/oz. Total reserves at Yanacocha are estimated at around 600 t of gold.

Barrick Gold Corporation is expected to start production at the Pierina mine in 1999. The heap leaching operation is expected to have a production capacity of 23 t/y at an initial cash cost of US\$50/oz.

Brazil

Brazil's 1998 gold production decreased by 6% to 56 t. Mining companies accounted for approximately 65% (36 t) of production in 1998, while the Garimpeiros' (artisanal miners) share of output continued to decline to 35% (20 t).

The sharp decline in the Garimpeiros' production from its peak of 90 t in 1989 is mainly due to the depletion of easily accessible alluvial gold deposits, more stringent environmental regulations, and restricted land access to certain regions, particularly in the Amazon. The number of Garimpeiros, which was estimated at one million in 1989 when Brazilian gold production peaked at 101 t, has declined to less than 300 000 in 1998.

Production by the Companhia Vale do Rio Doce (CVRD), Brazil's largest gold producer, was expected to reach 20 t in 1998. Currently, the Igarape Bahia mine is the company's largest gold mine with an output of 10 t of gold in 1998.

TVX Gold Inc. owns portions of two Brazilian operations. It has a 50% share in the Crixas mine and a 49% share in the Brasilia mine, which is the second largest gold operation in Brazil. TVX and its partner Rio Tinto Limited invested US\$65 million to increase production at Brasilia to 8 t/y beginning in 1998.

Chile

Chile's 1998 gold production decreased by 5% to around 50 t. Approximately 6 t, or 15%, of Chile's gold production was as a by-product of copper mining.

Barrick announced that the Pascua mine will produce an estimated 25 t/y of gold starting in 2001. Barrick also operates the El Indio and Tambo mines, which produced an estimated 8 t in 1998.

Teck Corporation and Anglo American Corporation announced that they will produce around 10 t/y of gold at the Lobo-Marte mine by the year 2000.

Mexico

Gold production in Mexico increased by 1 t to 27 t in 1998. As with other Latin American countries, Mexico's gold production outlook is fueled by foreign investment.

Currently, Industrias Penoles SA de CV is Mexico's largest gold producer with an output of 7 t/y. The La Cienega mine is Mexico's largest gold mine with an estimated output of 3 t/y.

Several projects are also expected to come on stream within the next few years. Metallica Resources Inc. and Cambior inc. are currently finalizing the feasibility study at the Cerro San Pedro gold-silver project.

Venezuela

Venezuela's gold production, estimated at 20 t in 1997, was mostly attributed to placer mining by several small private miners. State-owned Minerven is currently Venezuela's largest gold producer with an estimated output of 7 t/y.

Minera Las Cristinas (MINCA), which is 70% owned by Placer Dome Inc. and 30% owned by state-owned Corporacion Venezolana de Guyana, announced that construction at the Las Cristinas gold mine will start upon completion of financing. MINCA, which discovered Las Cristinas in 1992, has spent a total of US\$110 million on this project to date. Total proven and probable ore reserves at Las Cristinas are 326 Mt grading 1.1 g/t gold. Once in production, the Las Cristinas mine is expected to produce 15 t/y of gold.

Argentina

Argentina's gold production increased to around 20 t/y from 3 t/y following production start-up at the Bajo de la Alumbrera copper-gold mine. Bajo de la Alumbrera is owned by M.I.M. Holdings Limited (50%), North Limited (25%) and Rio Algom Limited (25%). Bajo de la Alumbrera has reserves of 581 Mt grading 0.67 g/t gold and 0.52% copper. The project is expected to have an average production level of 20 t/y over a 20-year period.

Amsa, a subsidiary of Anglo American Corporation and Perez Companac, brought on stream the Cerro Vanguardia mine in 1998. The US\$180 million project is expected to produce 6.5 t/y of gold.

Guyana

Production at the Omai gold mine in 1998 was 10 t. Total reserves at Omai are 50 Mt grading 1.4 g/t gold. Omai Gold Mines Limited is owned by Cambior (65%), Golden Star Resources Ltd. (30%) and the Guyana government (5%).

CONSUMPTION AND USES

Total world fabrication demand for gold in 1998 decreased by about 3% to reach 3770 t. Gold jewellery demand has doubled in the past 10 years; it exceeded total world production of gold by 665 t in 1998. World gold jewellery manufacturing decreased by about 4% to 3200 t in 1998.

Other important sectors where gold is in demand include electronics, dentistry and coinage. World demand from the electronics sector in 1998 remained stable at around 200 t. Japan accounts for nearly 40% of fabrication in this sector. World gold fabrication of coins in 1998 reached its highest level in seven years with an increase of 26% to around 120 t. The coinage market is subject to volatility from gold speculative trends and commemorative coin issues. Dentistry fabrication was stable at around 70 t, with Japan accounting for 30% of that market.

India is by far the world's largest and fastest-growing consumer of gold, increasing 20% in one year to reach 800 t in 1998. Other major gold consumers include the United States, 400 t (+17%), and China, 200 t (-9%).

Gold demand in Asian countries is being dampened by the Asian monetary crisis. As a result of the Asian financial crisis and the resulting liquidity problems faced by countries such as South Korea and Indonesia, several tonnes of gold originating mostly from the jewellery sector were melted to generate foreign

exchange earnings. Major decreases in gold consumption were registered in South Korea, -175 t (-250%); Indonesia, -65 t (-170%); and Japan, -80 t (-28%). Other factors that also negatively influenced the gold price in 1998 were the strength of the U.S. dollar, speculation, and forward sales by gold producers.

The Royal Canadian Mint produces the gold Maple Leaf bullion coins. Since its introduction in 1979, the Maple Leaf coin program has consumed some 548 t of gold, or 22.5% of total Canadian gold production during that period. In 1998 the gold Maple Leaf coin (20.9 t) ranked second in terms of world sales behind the U.S. Eagle coin (53 t).

Canada's gold fabrication demand increased to around 44 t in 1998 from 40 t in 1997. The increase was attributable to a major increase in sales of gold Maple Leaf coins from 16.7 t in 1997 to 20.9 t in 1998, its highest level since 1991. Apart from coin production, gold fabrication demand in Canada in 1998 was: jewellery, 22 t; electronics, 0.5 t; and dentistry and other industrial uses, 0.5 t. It is estimated that jewellery consumption in Canada stood at 20 t in 1998.

OUTLOOK

The world's current economic growth, low inflation rates, relatively stable political climate and low prices should help growth in demand for gold fabrication continue. The gap between fabrication demand and production in 1998 was 665 t. The creation of the European Central Bank (ECB) is expected to have a positive impact on the gold market because sales by member states will now have to be approved by the ECB. However, the Swiss National Bank's plan to sell over half of its gold reserves will require the approval of Swiss citizens. The potential Swiss sale of 2600 t and gold sales by other central banks and private institutions would dampen future price increases. With total central bank gold holdings of over 34 000 t, representing approximately 25% of all the gold that has ever been produced, the role of gold as a monetary instrument needs to be redefined.

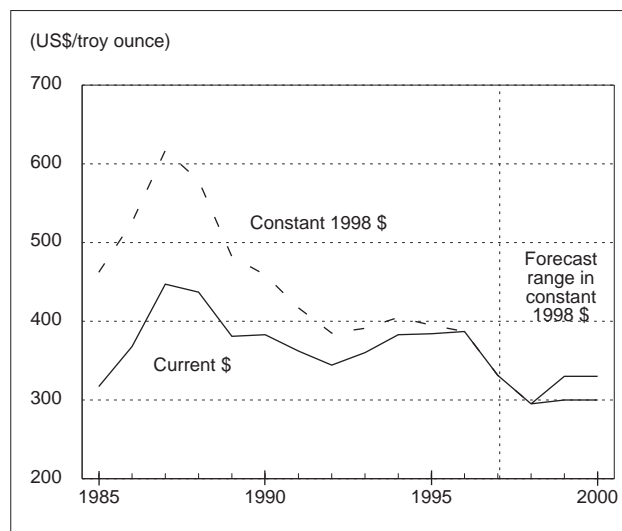
In 1999, a 1% increase in total gold fabrication demand is anticipated with the jewellery sector being responsible for most of that growth. The current low real interest rates and prices are positive for the gold fabrication market.

In 1999, an average gold price of US\$300/troy oz is forecast, compared to \$294/oz in 1998 and \$331/oz in 1997. In the medium term, the combined effect of increased demand for gold products, particularly in the jewellery sector, along with a stabilization of world gold production, should result in some strengthening in the price of gold. For the years

2000 and 2001, an average annual gold price of between US\$300 and \$330/oz (in constant 1998 dollars) is forecast.

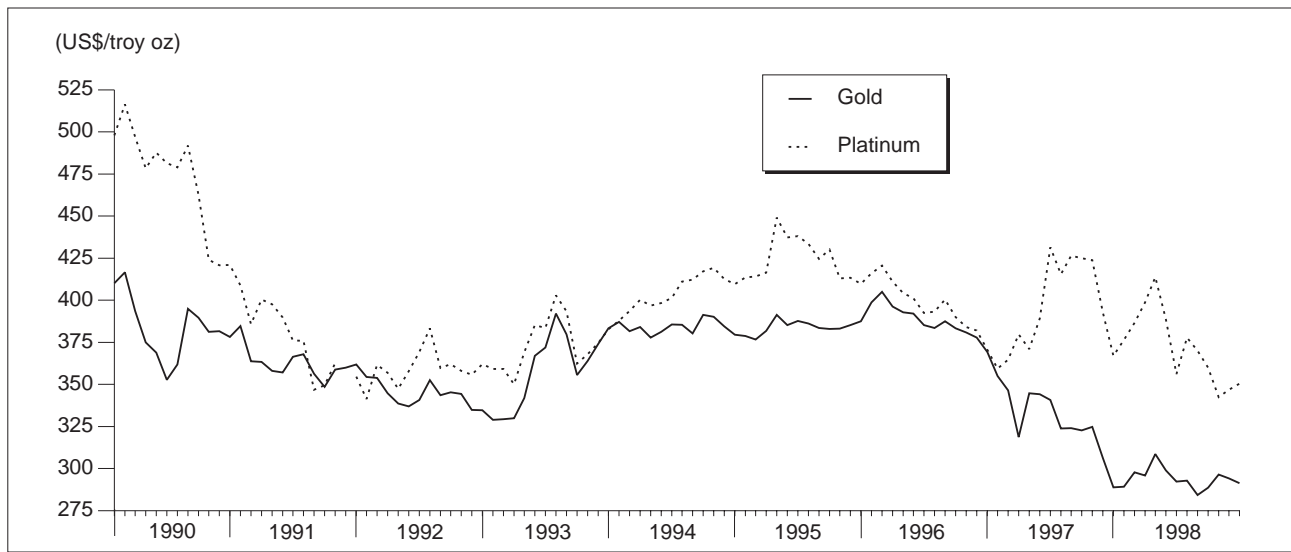
Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 65. (2) Information in this review was current as of February 15, 1999.

Figure 3
Gold Prices, Annual Average, 1985-2000



Source: Natural Resources Canada.

Figure 4
Precious Metal Prices, Monthly Averages, 1990-98



Sources: London Bullion Market Association; Johnson Matthey Public Limited Company.

TARIFFS

Item No.	Description	Canada			United States	EU	Japan ¹
		MFN	GPT	USA	Canada	MFN	WTO
71.08	Gold (including gold plated with platinum) unwrought or in semi-manufactured forms, or in powder form						
	Non-monetary:						
7108.11.00	Powder	Free	Free	Free	Free	0.8%	Free
7108.12.00	Other unwrought forms	Free	Free	Free	Free	Free	Free
7108.13	Other semi-manufactured forms						
7108.13.10	Of 10 carats or more	Free	Free	Free	Free	Free	Free
7108.13.20	Of less than 10 carats	4%	Free	Free	Free	Free	Free

Sources: Customs Tariff, effective January 1999, Revenue Canada; Harmonized Tariff Schedule of the United States, 1999; Worldtariff Guidebook on Customs Tariff Schedules of Import Duties of the European Union (38th Annual Edition: 1998); Customs Tariff Schedules of Japan, 1998.

¹ WTO rate is shown; lower tariff rates may apply circumstantially.

TABLE 1. CANADA, GOLD PRODUCTION AND TRADE, 1997 AND 1998

Item No.	1997		1998p		
	(kilograms)	(\$000)	(kilograms)	(\$000)	
PRODUCTION					
Newfoundland	2 858	42 121	1 392	19 468	
Prince Edward Island	—	—	—	—	
Nova Scotia	—	—	—	—	
New Brunswick	260	3 829	266	3 725	
Quebec	37 192	548 174	37 966	530 879	
Ontario	80 569	1 187 504	84 028	1 174 967	
Manitoba	8 182	120 598	x	x	
Saskatchewan	4 124	60 787	x	x	
Alberta	12	176	—	—	
British Columbia	17 513	258 123	21 736	303 937	
Yukon	6 659	98 150	5 705	79 767	
Northwest Territories	14 110	207 968	3 845	53 771	
Total	171 479	2 527 430	166 087	2 322 417	
Mine output	171 376	..	163 083	..	
EXPORTS					
2600.001	Gold in ores and concentrates	6 010	68 406	5 654	55 201
7108.11	Gold powder				
	United States	2 683	36 583	8 543	118 124
	Total	2 683	36 583	8 543	118 124
7108.12	Other unwrought forms				
	United States	156 129	2 344 599	145 440	2 057 697
	Switzerland	6 310	92 765	25 487	349 150
	Hong Kong	18 055	226 637	6 255	82 052
	South Korea	8 109	118 625	2 943	41 549
	United Kingdom	16	267	1 081	14 661
	Germany	7 451	110 810	983	13 887
	Saudi Arabia	—	—	998	13 636
	Australia	—	—	980	13 542
	China	502	4 988	487	6 778
	Japan	2 239	33 844	498	6 714
	Taiwan	9 530	143 605	486	6 686
	Panama	—	—	112	1 628
	Other countries	606	8 620	9	95
	Total	208 947	3 124 760	185 759	2 608 075
7108.13	Other semi-manufactured forms				
	United States	6 254	85 468	30 485	392 715
	France	235	3 630	77	1 143
	United Kingdom	83	1 251	23	346
	Portugal	105	1 579	—	—
	Total	6 677	91 928	30 585	394 204
	Total refined gold exports	224 317	3 321 677	230 541	3 175 604
IMPORTS²					
2600.003	Gold in ores and concentrates	3 337	39 070	4 435	48 775
7108.11	Gold powder				
	United States	6	73	6	72
	Italy	4	38	...	7
	United Kingdom	...	3	...	1
	Germany	1	18	—	—
	Ghana	55	590	—	—
	Total	66	722	6	80

TABLE 1 (cont'd)

Item No.	1997		1998 ^p		
	(kilograms)	(\$000)	(kilograms)	(\$000)	
IMPORTS (cont'd)					
7108.12	Other unwrought forms				
	United States	47 310	697 818	73 304	824 807
	Guyana	13 900	190 104	14 752	186 514
	Suriname	1 042	16 110	6 273	78 463
	United Kingdom	356	4 613	3 021	41 792
	South Korea	—	—	1 991	26 714
	Panama	4 724	16 442	7 222	21 105
	Cuba	—	—	818	8 504
	South Africa	71	936	630	8 125
	Dominican Republic	7 381	21 346	3 048	7 908
	China	—	—	410	5 448
	Venezuela	—	—	433	4 505
	Costa Rica	350	5 218	332	4 337
	Congo	—	—	113	1 420
	Other countries	7 356	103 005	239	1 291
	Total	82 490	1 055 591	112 586	1 220 934
7108.13	Other semi-manufactured forms				
	United States	685	10 477	660	9 109
	Ecuador	196	1 697	227	2 391
	Peru	—	—	192	1 790
	Switzerland	87	1 157	101	1 418
	Italy	3	51	124	929
	Other countries	2	61	14	181
	Germany	8	102	6	111
	United Kingdom	16	220	—	—
	Total	997	13 765	1 324	15 929
	Total refined gold imports	86 890	1 109 148	118 351	1 285 718

Sources: Natural Resources Canada; Statistics Canada.

— Nil; . . Not available; . . . Amount too small to be expressed; **p** Preliminary; **r** Revised.

¹ Includes HS classes 2603.00.82, 2607.00.82, 2608.00.82, 2616.10.82 and 2616.90.82. ² Imports from "Other countries" may include re-imports from Canada. ³ Includes HS classes 2603.00.00.82, 2604.00.00.82, 2607.00.00.82, 2608.00.00.82, 2616.10.00.82 and 2616.90.00.20.

Note: Numbers may not add to totals due to rounding.

TABLE 2. CANADA, GOLD PRODUCTION BY SOURCE, 1975, 1980 AND 1985-98

Year	Auriferous Quartz Mines		Placer Operations		Base-Metal Ores		Total	
	(kg)	(%)	(kg)	(%)	(kg)	(%)	(kg)	(%)
1975	37 530	73.0	335	0.6	13 569	26.4	51 433	100.0
1980	31 929	63.1	2 060	4.0	16 632	32.9	50 620	100.0
1985	67 241	76.8	3 464	4.0	16 857	19.2	87 562	100.0
1986	83 197	80.9	2 802	2.7	16 900	16.4	102 899	100.0
1987	94 723	81.8	4 009	3.5	17 086	14.8	115 818	100.0
1988	112 404	83.4	4 879	3.6	17 530	13.0	134 813	100.0
1989	138 211	86.6	5 354	3.4	15 930	10.0	159 494	100.0
1990	147 355	88.0	3 993	2.4	16 025	9.6	167 373	100.0
1991	153 859	87.8	3 834	2.2	17 589	10.0	175 282	100.0
1992	141 965	88.5	3 469	2.2	14 917	9.3	160 351	100.0
1993	137 346	89.7	3 787	2.5	11 997	7.8	153 129	100.0
1994	133 018	90.8	3 714	2.5	9 696	6.6	146 428	100.0
1995	132 834	88.0	5 303	3.5	12 730	8.4	150 867	100.0
1996	147 052	89.3	3 971	2.4	13 636	8.3	164 660	100.0
1997	155 543	90.7	3 987	2.3	11 949	7.0	171 479	100.0
1998 ^p	149 391	89.9	2 983	1.8	13 714	8.2	166 089	100.0

Source: Natural Resources Canada.

p Preliminary.

Note: Numbers may not add to totals due to rounding.

TABLE 3. WORLD MINE PRODUCTION OF GOLD, 1980 AND 1990-97

Country	1980	1990	1991	1992	1993	1994	1995	1996	1997
	(tonnes)								
South Africa	675.1	605.1	601.1	614.1	619.5	583.9	522.4	494.6	489.0
Canada ¹	50.6	167.4	175.3	160.4	153.1	146.4	150.9	164.7	171.5
United States	30.5	294.2	296.0	329.1	332.1	326.0	319.0	329.3	351.4
Other Africa									
Ghana	10.8	17.3	27.3	33.3	41.4	44.5	52.7	50.7	55.7
Zimbabwe	11.4	17.9	19.1	19.9	20.7	22.5	26.1	26.7	24.3
Other	11.0	35.3	43.5	48.1	49.2	50.9	52.1	51.0	60.8
Total, other Africa	33.2	70.5	89.9	101.3	111.3	117.9	130.9	128.4	140.8
Latin America									
Peru	5.0	14.6	15.1	18.0	27.4	39.3	57.4	64.8	74.8
Brazil	35.0	84.1	78.6	76.5	75.7	73.4	67.4	64.2	59.1
Chile	9.3	33.3	33.0	39.3	38.5	43.3	48.5	56.4	52.9
Mexico	5.9	9.6	8.5	10.4	11.1	13.9	20.3	24.5	36.1
Venezuela	1.0	14.2	13.2	11.7	11.2	13.7	17.1	19.9	21.0
Colombia	17.0	32.5	30.7	29.9	26.4	25.5	24.1	23.1	20.6
Bolivia	2.0	10.4	10.0	7.9	12.1	14.7	16.0	15.2	15.8
Guyana	—	2.5	2.8	3.4	10.0	11.7	8.8	11.4	13.5
Ecuador	0.7	10.0	9.2	8.6	8.1	7.6	10.6	12.2	10.5
Other	15.6	9.1	9.0	9.2	8.6	8.9	11.9	12.8	20.7
Total, Latin America	91.5	220.3	210.1	214.9	229.1	252.0	282.1	304.4	312.1
Asia									
Indonesia	2.1	17.6	24.4	45.9	52.2	55.3	74.1	92.1	101.4
Papua New Guinea	14.3	33.6	60.8	71.2	61.5	60.5	54.9	53.0	49.9
Philippines	22.0	37.2	30.5	27.2	29.8	31.0	29.4	31.1	33.8
Japan	6.7	7.3	8.3	8.9	9.4	9.6	9.2	8.6	8.7
Other	5.0	12.7	14.6	16.2	18.6	19.4	20.5	20.9	22.4
Total, Asia	50.1	108.4	138.6	169.4	171.5	175.8	188.1	205.7	216.2
Europe	11.8	35.2	32.2	25.3	25.1	26.4	28.1	27.9	32.5
Oceania									
Australia	17.0	244.2	236.2	243.5	247.3	254.9	253.5	288.8	311.4
Other	1.0	10.1	10.3	14.3	15.0	14.1	14.9	16.3	15.5
Total, Oceania	18.0	254.3	246.5	257.8	262.3	269.0	269.0	305.1	326.9
Total, Western World	960.8	1 755.4	1 789.7	1 872.3	1 904.0	1 898.0	1 890.5	1 960.1	2 040.6
Other countries									
C.I.S.	..	270.0	252.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Russia	..	..	..	151.7	164.5	158.1	142.1	130.0	137.0
Uzbekistan	..	..	..	64.5	66.6	64.4	63.6	71.0	81.7
Other C.I.S.	..	..	..	13.5	17.6	20.0	21.2	22.0	32.9
China	..	93.6	103.9	112.2	119.4	120.7	132.6	144.6	156.8
North Korea	..	13.0	13.0	17.0	15.0	14.0	14.0	13.3	9.4
Mongolia	..	1.0	0.8	1.0	1.4	2.1	4.9	5.3	8.9
Total, other countries	..	377.6	369.7	359.9	384.5	379.3	378.4	386.2	426.9
Total, world production	..	2 133.0	2 159.4	2 232.2	2 288.5	2 276.7	2 268.9	2 346.3	2 467.3

Source: Consolidated Gold Fields PLC, "Gold 1997."

— Nil; .. Not available; n.a. Not applicable.

¹ Production figures for Canada were obtained from Natural Resources Canada.

TABLE 4. CANADA, GOLD PRODUCTION, AVERAGE VALUE AND PERCENT OF TOTAL MINERAL PRODUCTION, 1975, 1980 AND 1985-98

Year	Total Production	Total Value	Average Value ¹	Gold as a Percent of Total Mineral Production
	(kg)	(\$000)	(\$/g)	(%)
1975	51 433	270 830	5.27	2.0
1980	50 620	1 165 416	23.02	3.7
1985	87 562	1 219 653	13.93	2.7
1986	102 899	1 689 292	16.42	5.2
1987	115 818	2 204 472	19.03	6.1
1988	134 813	2 331 989	17.30	6.3
1989	159 494	2 315 860	14.52	5.9
1990	167 373	2 407 654	14.38	5.9
1991	175 282	2 338 614	13.34	6.7
1992	160 351	2 141 161	13.35	6.0
1993	153 129	2 284 991	14.92	6.2
1994	146 428	2 448 926	16.86	6.0
1995	150 867	2 557 502	16.95	5.9
1996	164 660	2 799 547	17.00	5.6
1997	171 479	2 527 429	14.74	5.0
1998 ^p	166 089	2 322 417	13.98	5.2

Source: Natural Resources Canada.

^p Preliminary.¹ Value is based on average London p.m. fix price for gold.**TABLE 5. GOLD FABRICATION IN DEVELOPED AND DEVELOPING COUNTRIES, 1980 AND 1991-97**

Fabricated Gold	1980	1991	1992	1993	1994	1995	1996	1997
	(tonnes)							
DEVELOPED COUNTRIES								
Carat jewellery	318	883	925	892	890	901	891	956
Electronics	93	140	129	139	148	161	162	182
Dentistry	63	51	55	54	55	59	59	62
Other uses	58	57	60	60	62	64	65	63
Medals and fake coins	18	9	6	4	4	3	2	3
Official coins	170	121	77	98	58	70	47	83
Subtotal	719	1 261	1 252	1 247	1 217	1 258	1 227	1 349
DEVELOPING COUNTRIES								
Carat jewellery	196	1 474	1 833	1 660	1 720	1 866	1 916	2 372
Electronics	2	65	46	41	42	44	45	56
Dentistry	2	12	11	10	9	8	8	8
Other uses	4	16	25	39	41	44	46	50
Medals and fake coins	3	18	23	21	23	32	32	40
Official coins	21	22	16	19	22	14	16	16
Subtotal	228	1 607	1 953	1 790	1 857	2 008	2 063	2 542
TOTAL								
Carat jewellery	514	2 357	2 758	2 552	2 610	2 767	2 807	3 328
Electronics	95	205	175	180	190	205	207	238
Dentistry	65	63	66	64	64	67	67	70
Other uses	62	67	85	99	103	108	111	113
Medals and fake coins	21	27	29	25	27	38	34	43
Official coins	191	143	93	117	80	84	63	99
Total	946	2 868	3 206	3 037	3 074	3 269	3 290	3 891

Source: Consolidated Gold Fields PLC, "Gold 1997."

Note: Numbers may not add to totals due to rounding.

TABLE 6. AVERAGE ANNUAL GOLD PRICES, 1934-98, AND MONTHLY, 1994-98

Year	US\$/oz	C\$/oz	Year	US\$/oz	C\$/oz
1934-67	35	. .	1983	423.52	521.82
1968	38.82	41.82	1984	360.63	466.99
1969	41.13	44.29	1985	317.35	433.21
1970	35.97	37.54	1986	367.58	510.73
1971	40.87	41.27	1987	446.66	592.18
1972	58.22	57.66	1988	436.45	554.76
1973	97.22	97.24	1989	381.27	451.33
1974	158.80	155.36	1990	383.72	447.79
1975	160.96	163.76	1991	362.34	415.09
1976	124.78	123.01	1992	343.86	415.23
1977	147.80	157.10	1993	360.06	464.35
1978	193.51	220.74	1994	384.15	524.60
1979	305.69	358.12	1995	384.07	526.94
1980	614.38	719.08	1996	387.69	528.62
1981	459.22	550.57	1997	328.41	454.52
1982	375.52	463.51	1998	294.11	435.77

Month	1994		1995		1996		1997		1998	
	(US\$/oz)	(C\$/oz)	(US\$/oz)	(C\$/oz)	(US\$/oz)	(C\$/oz)	(US\$/oz)	(C\$/oz)	(US\$/oz)	(C\$/oz)
January	387.14	509.53	378.74	535.16	398.70	545.02	355.03	479.65	289.26	416.53
February	381.66	518.66	376.75	527.45	404.92	556.77	346.43	469.41	297.74	425.77
March	384.00	523.87	381.82	537.22	396.35	540.62	318.76	437.02	295.87	420.14
April	377.91	522.70	391.34	538.88	392.87	533.91	344.71	480.53	308.56	441.24
May	381.18	526.06	385.23	523.91	391.99	536.63	344.10	474.86	298.95	430.49
June	385.71	533.63	387.62	534.14	385.25	526.25	340.83	471.71	292.22	426.64
July	385.45	532.98	386.14	525.54	383.46	525.34	323.78	445.52	292.89	436.41
August	380.21	524.14	383.50	519.64	387.51	531.66	324.00	450.03	284.23	434.87
September	391.37	529.95	382.93	517.72	383.29	524.72	322.62	447.15	288.67	438.78
October	390.16	526.82	383.20	515.79	380.91	514.23	324.85	450.24	296.48	456.58
November	384.38	524.32	385.21	521.19	377.85	505.56	306.35	432.57	294.24	453.13
December	379.48	526.91	387.44	530.02	369.34	502.67	288.78	412.09	291.34	448.66

Source: London Bullion Market Association, a.m. fix, as compiled by Natural Resources Canada.
. . Not available.